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DOES THE TOTAL PRESENTING BLADDER VOLUME (TPBV) AT URODYNAMICS HAVE ANY DIAGNOSTIC VALUE?

Hypothesis / aims of study

The total presenting bladder volume (TPBV) at the time of urodynamic studies has not before been regarded as a separate urodynamic parameter. It is determined by the summation of the voided volume at uroflowmetry and the postvoid residual (PVR). Not having been subject to research, it is therefore also unknown if the TPBV has any diagnostic value in women. The TPBV has not been tested for its relationships with urogynecological symptoms, signs and diagnoses. The TPBV will be influenced by instructions given to the patient, though in many women the nature of those symptoms and diagnoses are thought to limit the level of the TPBV.

Study design, materials and methods

The study involved 1140 woman attending for an initial urogynecological assessment including urodynamics. The instructions given both at booking and at confirmation of their appointment were that (i) they should eat and drink normally; (ii) they should come with a “comfortably full bladder”; (iii) they should not empty their bladder in the hour prior to the scheduled time for their appointment (around 80-90 minutes prior to testing for clinical stress leakage and voiding studies). Voided volumes were measured at the time of uroflowmetry; PVRs were measured using transvaginal ultrasound within 60 seconds of voiding. The total bladder volume (mls) for a patient was the summation of the voided volume and the PVR. Cystometry completed the investigations. A median TPBV was obtained. Data were separated according to (i) 0mls – median TPBV (ii) over median TPBV. Clinical and urodynamic parameters possibly associated with the TPBV were assessed using multiple logistic regression analysis

Results

Median TPBV was 174mls. Table 1 shows the associations of higher (0-174mls) and higher TPBV (175mls and higher) with a wide range of clinical and urodynamic variables. In overall terms, women presenting with TPBVs up to the median (0-174mls) were found to be significantly more likely to be older, of lower parity (0-1), have the symptom of nocturia and the final diagnosis of detrusor overactivity whilst they are significantly less likely to have prolapse particularly posterior vaginal and apical vaginal prolapse

Interpretation of results

The TPBV, a new urodynamic parameter, studied here for the first time, has been shown to be influenced by the patient’s bladder problem. TPBVs below the median (174mls) might reflect a bladder storage problem They are more prevalent in nulliparous women, those with nocturia and the diagnosis of detrusor overactivity. Lower TPBVs are less likely in women with prolapse, the latter more likely to be parous. Lower urine flow rate centiles in women with lower TPBVs (?ageing effect) is balanced by higher PVRs in women with higher TPBVs (? prolapse effect) so that the relationship between voiding difficulty and TPBVs is not significant.

Concluding message

The TPBV is a relevant urodynamic parameter, clearly influenced by the woman’s bladder dysfunction. There is a significant link between lower TPBVs and bladder storage disorders.

Table: Comparison of the clinical and urodynamic profiles of women with (i) total presenting bladder volume (TPBV) 0-174mls and (ii) TPBV 175mls or more.

	TPBV 0-174mls	**TPBV over 175mls**	**p-value**
Number of patients	569	571	
Median age (range)	61 (18 to 97)	55 (18 to 98)	<0.001*
Parity			
0-1	167 (29%)	121 (21%)	
2 or more	402 (71%)	450 (79%)	0.002*
Presenting symptoms			
Stress incontinence	316 (56%)	347 (61%)	0.073
Urge incontinence	293 (51%)	299 (52%)	0.769
Voiding difficulty	60 (11%)	78 (14%)	0.107
Frequency	215 (38%)	231 (40%)	0.356
Nocturia	169 (30%)	138 (24%)	0.034*
Urgency	235 (41%)	249 (44%)	0.431
Prolapse	179 (31%)	189 (33%)	0.553
UTI			
2 or more	107 (19%)	106 (19%)	0.917
Prior hysterectomy	177 (31%)	186 (33%)	0.595
Prior continence surgery	85 (15%)	73 (13%)	0.293
Menopause			
Menopause and HRT	110 (19%)	102 (18%)	0.524
Clinical stress leakage (sign)	385 (68%)	406 (71%)	0.208
Retroverted uterus (uterus present)	128 (33%)	146 (38%)	0.118
Prolapse			

Anterior vaginal (Grade>0)	316 (56%)	346 (61%)	0.083
Uterine (Grade>0)	177 (45%)	180 (47%)	0.563
Posterior vaginal (Grade>0)	268 (47%)	312 (55%)	0.011*
Apical vaginal (Grade>0)	118 (21%)	147 (26%)	0.045*
MUFR (Median Centile)	10.75	25.50	<0.001*
AUFR (Median Centile)	5.10	12.40	<0.001*
PVR (mean – mls)	13.88	30.06	0.006*
Final diagnosis			
USI	410 (72%)	409 (72%)	0.873
Detrusor Overactivity	158 (28%)	101 (18%)	<0.001*
Voiding difficulty	212 (37%)	194 (34%)	0.247
Prolapse (Grade>0)	347 (61%)	380 (67%)	0.051

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Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**St Vincent's Hospital, Sydney. Australia**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**